

Amendments to the Claims:

Please cancel all claims 1 through 24 and add the following new claims 25 through 36.

25. (New): A method of searching and updating a database in a multi-processing environment, comprising the steps of
maintaining two databases, database1 for searching and a database2 for updating,
after updating database2, switching the databases so that the updated database becomes database1 and the non-updated database becomes database2,
allowing searches in progress at the time of switching of the database to continue in now database2,
allowing new searches to initiate in now database1,
when all searches in database2 have completed, updating database2 with the prior update that caused to the last database switch,
preventing another database switch until after the last step has completed.

26. (New): Apparatus for searching and updating a database in a multi-processing environment, comprising:

means for maintaining two databases, a database1 for searching and a database2 for updating,
means for updating database2 after switching the databases so that the updated

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database becomes database1 and the non-updated database becomes database2,

means for allowing searches in progress at the time of switching of the databases to continue in now database2,

means for allowing new searches to initiate in now database1,

means for determining when all searches in database2 have completed, and

means responsive to the last mentioned determining means for updating database2 with the prior update that caused the last database switch, and

means for preventing another database switch until after the last step has completed.

27. (New): A program product storage medium containing computer instructions that when executed in a computer perform a method of searching and updating a database in a multi-processing environment, the method comprising the steps of maintaining two databases, database1 for searching and a database2 for updating,

after updating database2, switching the databases so that the updated database becomes database1 and the non-updated database becomes database2,

allowing searches in progress at the time of switching of the database to continue in now database2,

allowing new searches to initiate in now database1,

when all searches in database2 have completed, updating database2 with the

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preventing another database switch until after the last step has completed.

28. (New): A carrier wave containing computer instructions that when executed in a computer perform a method of searching and updating a database in a multi-processing environment, the method comprising the steps of

maintaining two databases, database1 for searching and a database2 for updating,

after updating database2, switching the databases so that the updated database becomes database1 and the non-updated database becomes database2,

allowing searches in progress at the time of switching of the database to continue in now database2,

allowing new searches to initiate in now database1,

when all searches in database2 have completed, updating database2 with the prior update that caused to the last database switch,

preventing another database switch until after the last step has completed.

29. (New): A computer program product for serializing data structure retrievals and updates in a multi-processing computer system, the computer program product embodied on one or more computer-readable media and comprising:

computer-readable program code means for creating two identical database

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structures, each representing an initial state for accessing stored data;

computer-readable program code means for performing searches against a first of the two databases, said means for performing searches further comprising a first program instruction for incrementing a search use count atomically to insure no interference from other processes and a second instruction for decrementing the use count atomically after performing the search;

computer-readable program code means for performing a first update against a second of the two databases, yielding a revised database;

computer-readable program code means for switching the first database and the revised database, such that the first database becomes the second database and the revised database becomes the first database, said means for switching the databases further comprising a third instruction for re-ordering database pointers atomically to prevent interference from other processes;

computer-readable program code means for performing, after operation of the computer-readable program code means for switching, a second update against the second database, yielding a synchronized database that is structurally identical to the first database;

said program means for performing searches further comprising program means for activating the last-mentioned means for performing a second update against the second database when the search use count for the now second database is zero.

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30.(New): The computer program product according to Claim 29, further comprising:

computer-readable program code means for obtaining an exclusive lock prior to operation of the computer-readable program code means for performing the first update; and

computer-readable program code means for releasing the exclusive lock after operation of the computer-readable program code means for performing the second update and the computer-readable program code means for switching.

31.(New): The computer program product according to Claim 29, wherein the computer-readable program code means for performing the first update further comprises computer-readable program code means for queuing a transaction, and wherein the computer-readable program code means for performing the second update further comprises computer-readable program code means for applying the queued transaction against the second database that results from operation of the computer-readable program code means for switching.

32.(New): The computer program product according to Claim 29, further comprising computer-readable program code means for performing a subsequent update against the synchronized database that results from operation of the computer-readable program code means for performing the second update; and wherein operation of the

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computer-readable program code means for performing the subsequent update causes another operation of the computer-readable program code means for switching.

33.(New): A computer system for serializing data structure retrievals and updates in a multi-processing computer system, the computer system comprising:

means for creating two identical database structures, each representing an initial state for accessing stored data;

means for performing searches against a first of the two databases, said means for performing searches further comprising means for incrementing a search use count for each search atomically to insure no interference from other processes and means for atomically decrementing the use count after performing the search ;

means for performing a first update against a second of the two databases, yielding a revised database;

means for switching the first database and the revised database, such that the first database becomes the second database and the revised database becomes the first database, said means for switching the databases further comprising means for re-ordering database pointers atomically to prevent interference from other processes;

means for performing, after switching the databases, a second update against the second database yielding a synchronized database that is structurally identical to the first database;

said means for performing searches further comprising means for activating the

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last-mentioned means for performing a second update against the second database when the search use count for the now second database is zero.

34.(New): The system according to Claim 33, further comprising:

means for obtaining an exclusive lock prior to operation of the means for performing the first update; and
means for releasing the exclusive lock after operation of the means for performing the second update and the means for switching.

35.(New): The system according to Claim 33, wherein the means for performing the first update further comprises means for queuing a transaction, and wherein the means for performing the second update further comprises means for applying the queued transaction against the second database that results from operation of the means for switching.

36.(New): The system according to Claim 33, further comprising means for performing a subsequent update against the synchronized database that results from operation of the means for performing the second update; and wherein operation of the means for performing the subsequent update causes another operation of the means for switching.

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37.(New): A method for serializing data structure retrievals and updates in a multi-processing computer system, comprising the steps of:

creating two identical database structures, each representing an initial state for accessing stored data;

performing searches against a first of the two databases, said performing searches further comprising incrementing a search use count while insuring no interference from other processes and decrementing the use count after performing the search also while insuring no interference from other processes ;

performing a first update against a second of the two databases, yielding a revised database;

switching the first database and the revised database, such that the first database becomes the second database and the revised database becomes the first database, said switching the databases further comprising re-ordering database pointers while preventing interference from other processes;

performing, after the switching of databases, a second update against the second database, yielding a synchronized database that is structurally identical to the first database;

said performing searches further comprising activating the last-mentioned step for performing a second update against the second database when the search use count for the now second database is zero.

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- 38.(New): The method according to Claim 37, further comprising steps of:
obtaining an exclusive lock prior to performing the first update; and
releasing the exclusive lock after performing the second update and the
switching.
- 39.(New): The method according to Claim 37, wherein the step of performing the
first update further comprises queuing a transaction, and wherein the step of performing
the second update further comprises applying the queued transaction against the
second database that results from operation of the switching step.
- 40.(New): The method according to Claim 37, further comprising the step of
performing a subsequent update against the synchronized database that results from
performing the second update; and wherein the step of performing the subsequent
update causes repeating the switching step.